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AMOG Consulting Sea-Saw WEC

Jack McDonald

Senior Engineer

AMOG Consulting

This project has received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement 883751.

Agenda

- “Sea-Saw” WEC technology overview
  - Background
  - Key features
  - Advantages
- Phase 1
  - Activities
  - Outcomes & lessons learnt
- Phase 2
  - Project team
  - Activities & milestones
  - Progress update

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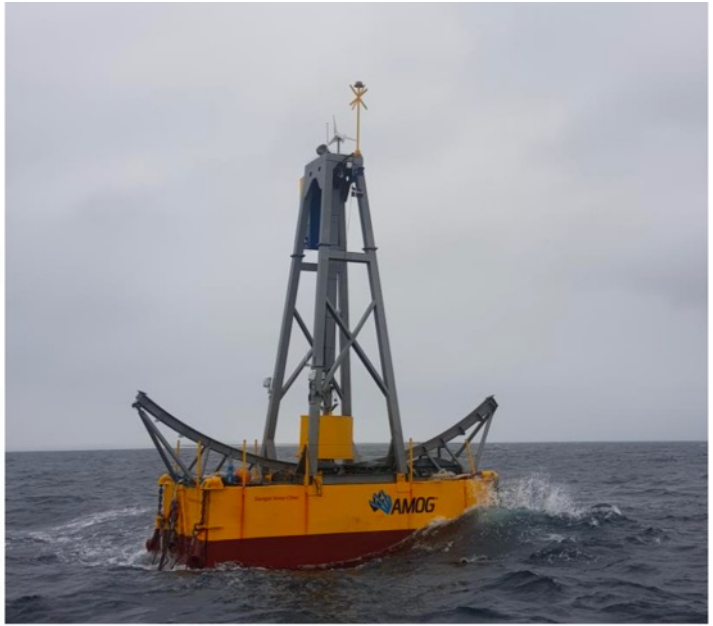
Background

- Leveraging AMOG's 2019 trial campaign and learnings from UK FabTest
- Enabled the identification of underlying challenges in the deployment and operation of a WEC
- Experience leading to evolution of the technology



FabTest trials conducted with the support of

European Union
European Regional Development Fund

GLOBAL CONNECTIONS FUND

MARINE

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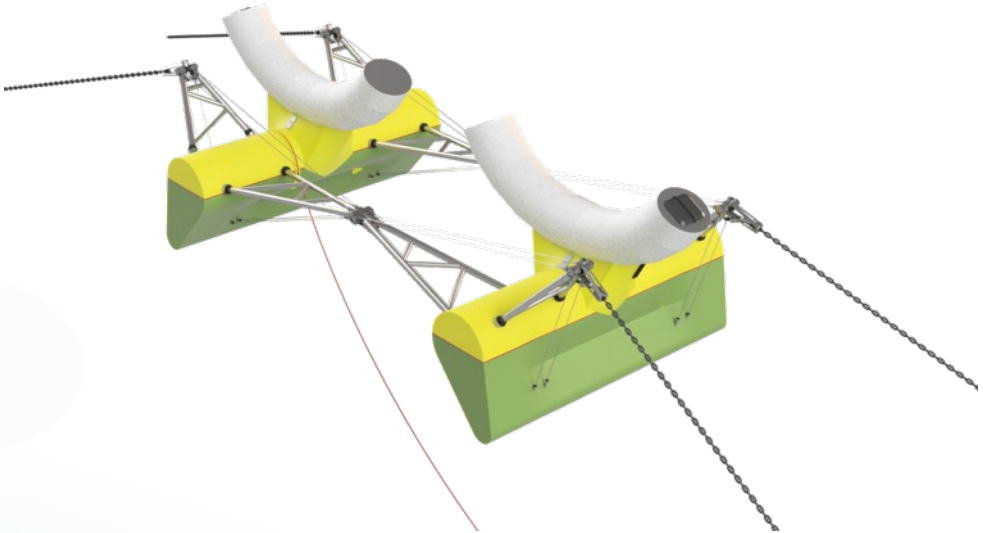
Sea-Saw WEC Technology Overview

Key features:

- Two hulls, connected by hinges
- Combined surge and pitch device
- Rolling PTO mechanism in sealed environment
- Minimum offshore oversight required



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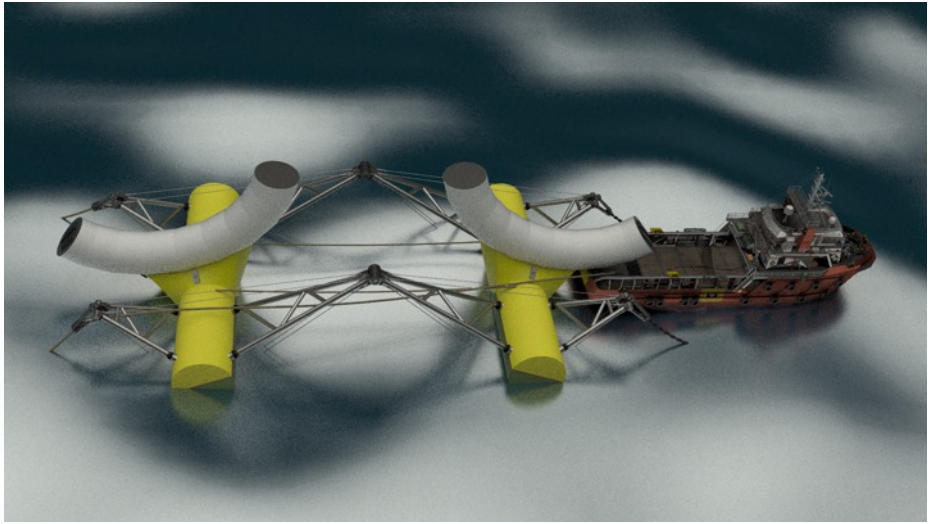
Sea-Saw WEC Technology Overview

Advantages

- All moving parts above water and accessible
- Designed for straight forward low-cost installation
- Simple cost-effective offshore maintenance and changeout of key components
- Make use of proven existing offshore infrastructure & equipment such as shipyards, tugs, anchors etc.



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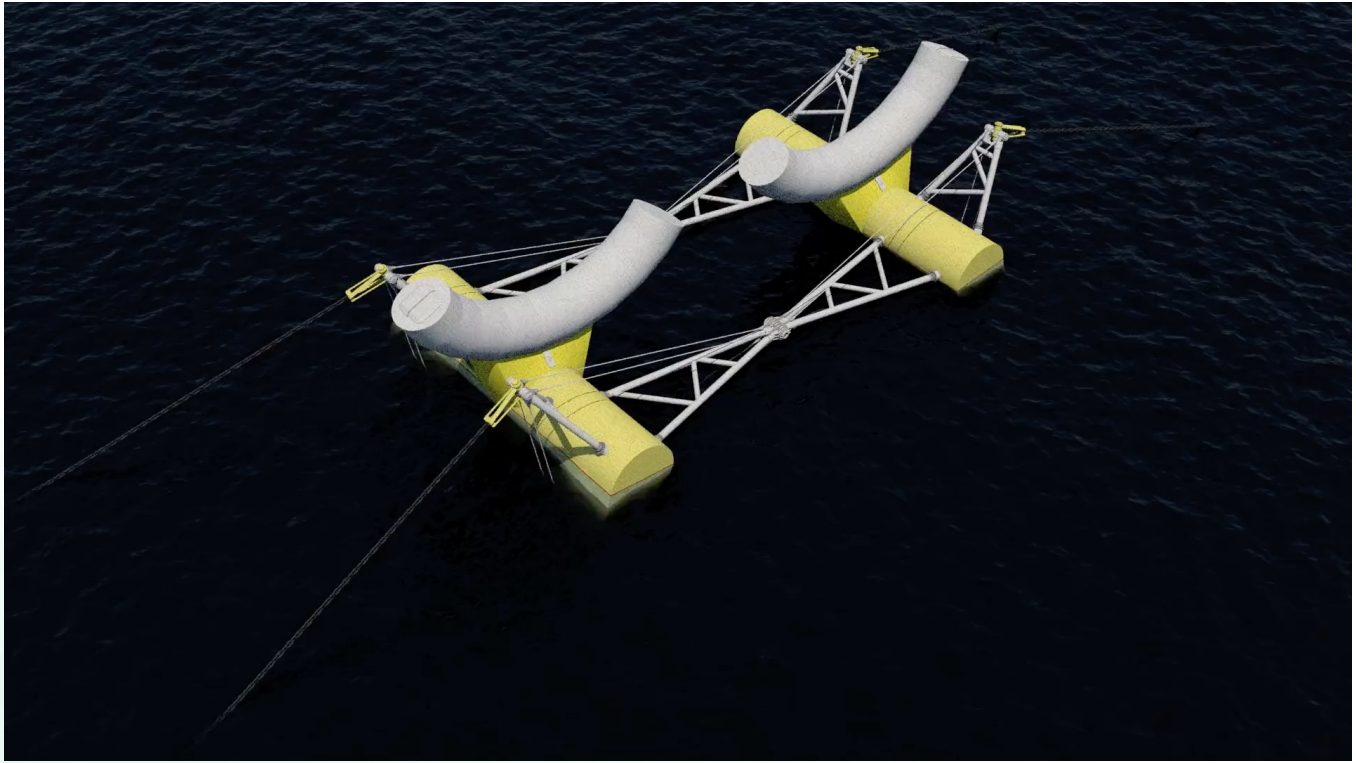
Sea-Saw WEC Technology Overview



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Phase 1: Activities

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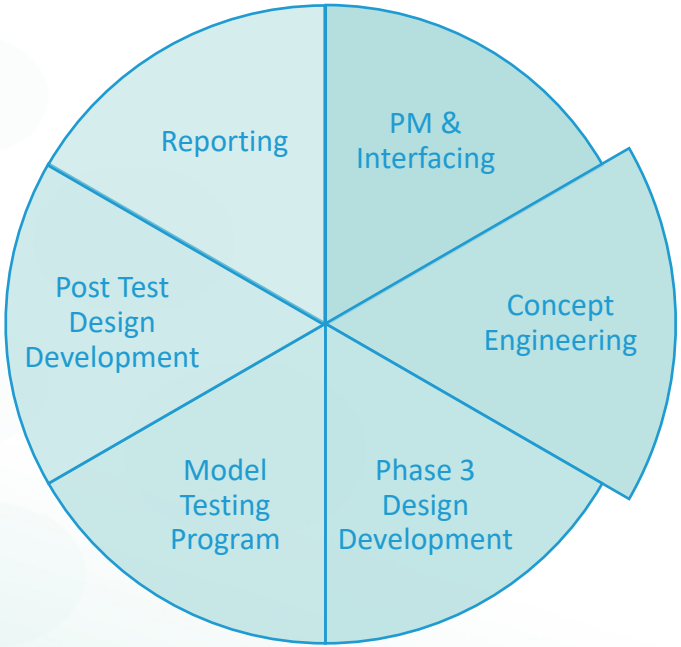

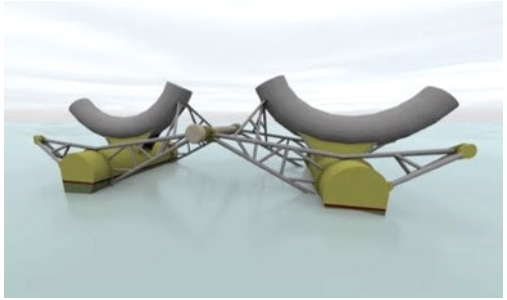

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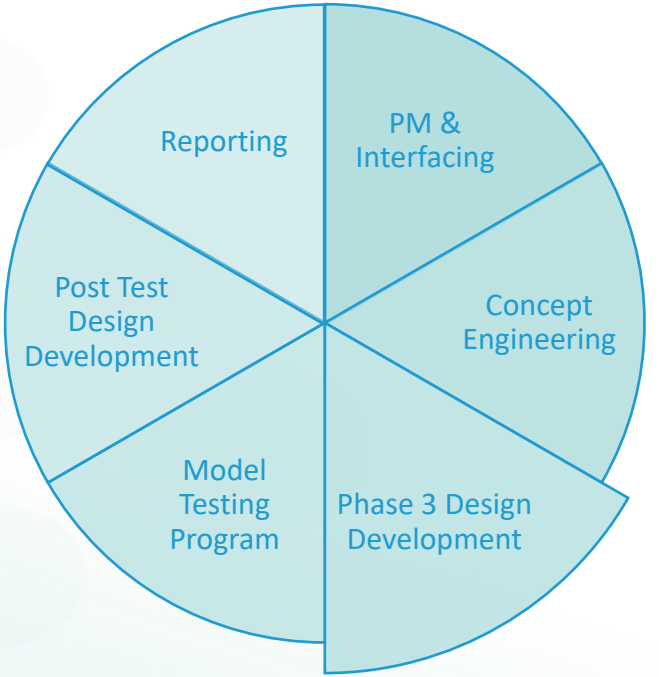

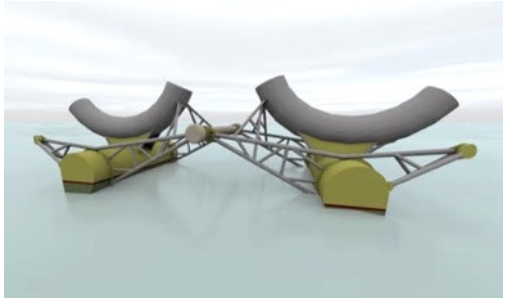

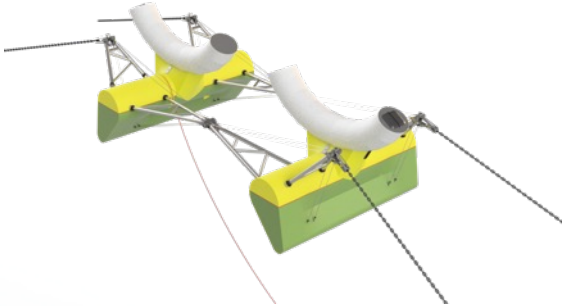

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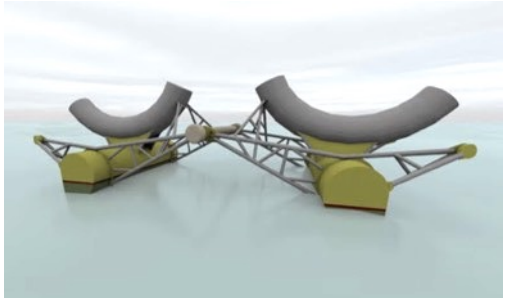

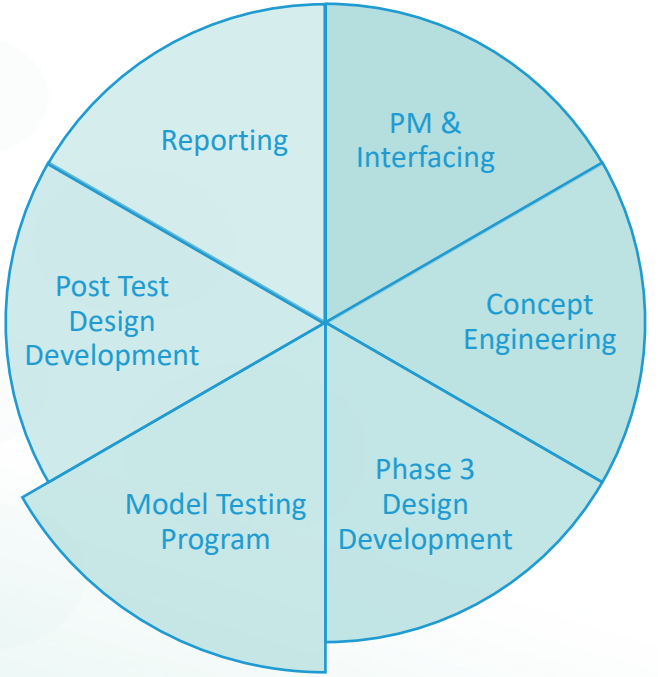

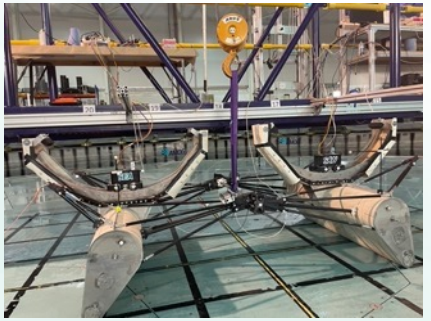

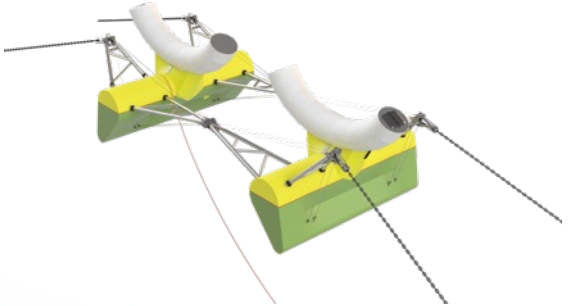

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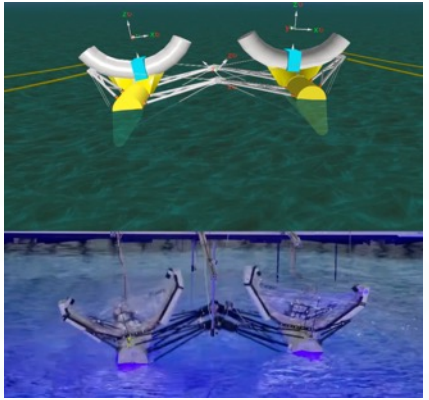

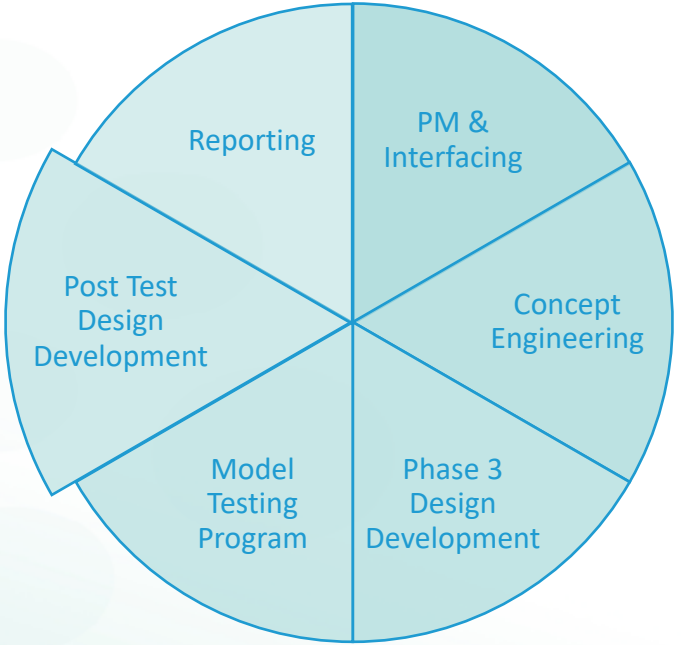

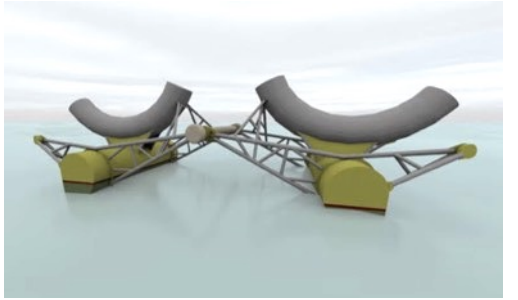

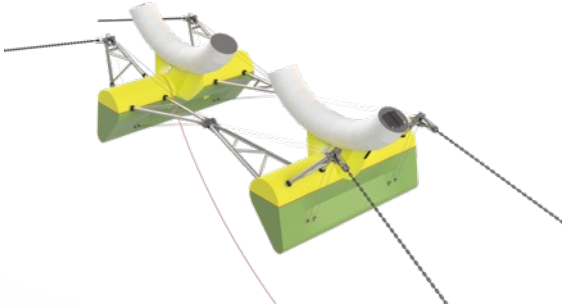

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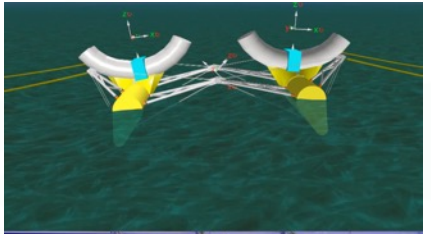

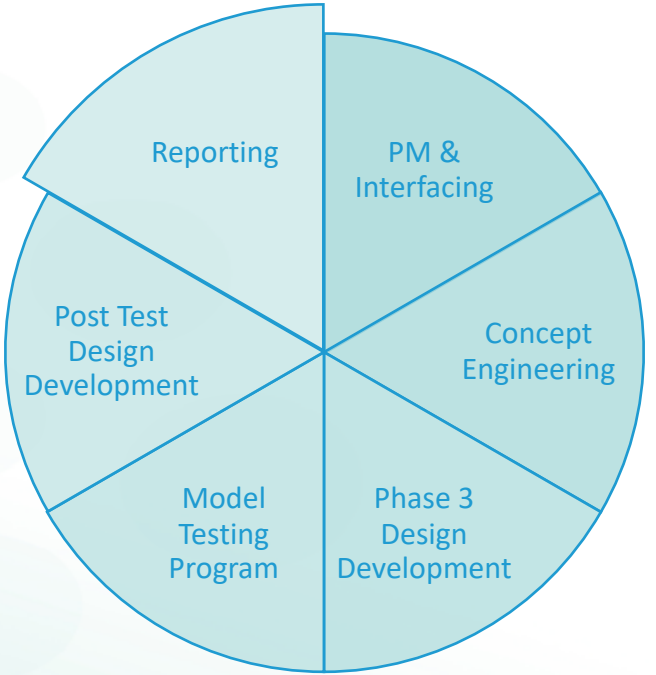

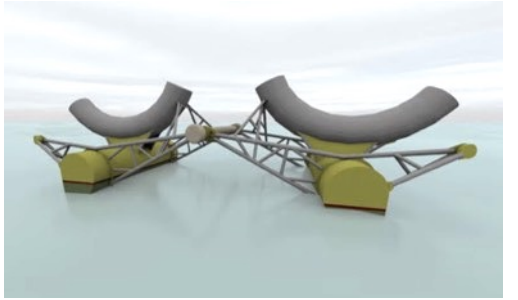

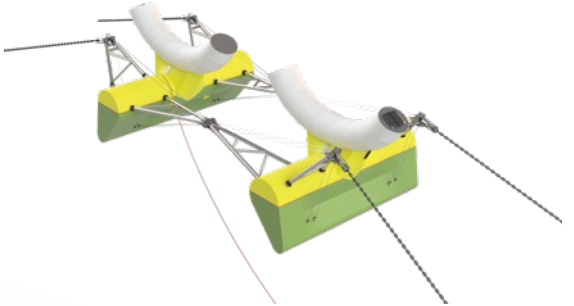

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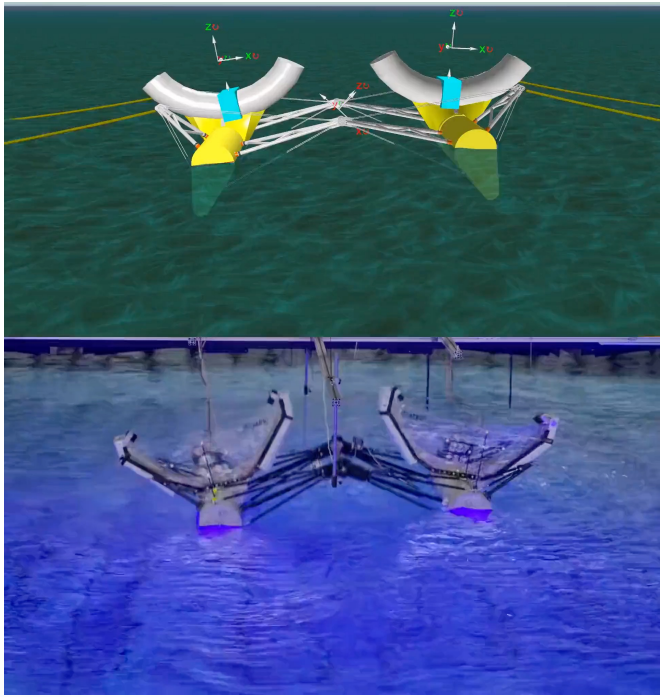
Phase 1: Outcomes & Lessons Learnt

- Outcomes:
  - Successful model test campaign
  - Good agreement with numerical model
  - Demonstrated viability of the concept structural design
  - Demonstrated power production in variety of sea-states
- Lessons learnt:
  - Reduced scale for Phase 3
  - Fatigue challenges
  - Further design optimisations required



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Phase 2: AMOG Project Team

David Rowley

Project Director

Jack McDonald

Senior Engineer

Claire Lazarides

Project Engineer

Stuart Wales

Principal Engineer

Hayden Marcollo

Principal Engineer

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Phase 2: Design Partners

- Mainstay Marine
  - Hull & PTO enclosure engineering design
  - Constructability
- Supply Design
  - Electrical systems
  - Thermal systems
  - Control system integration
- FloWave
  - Model testing

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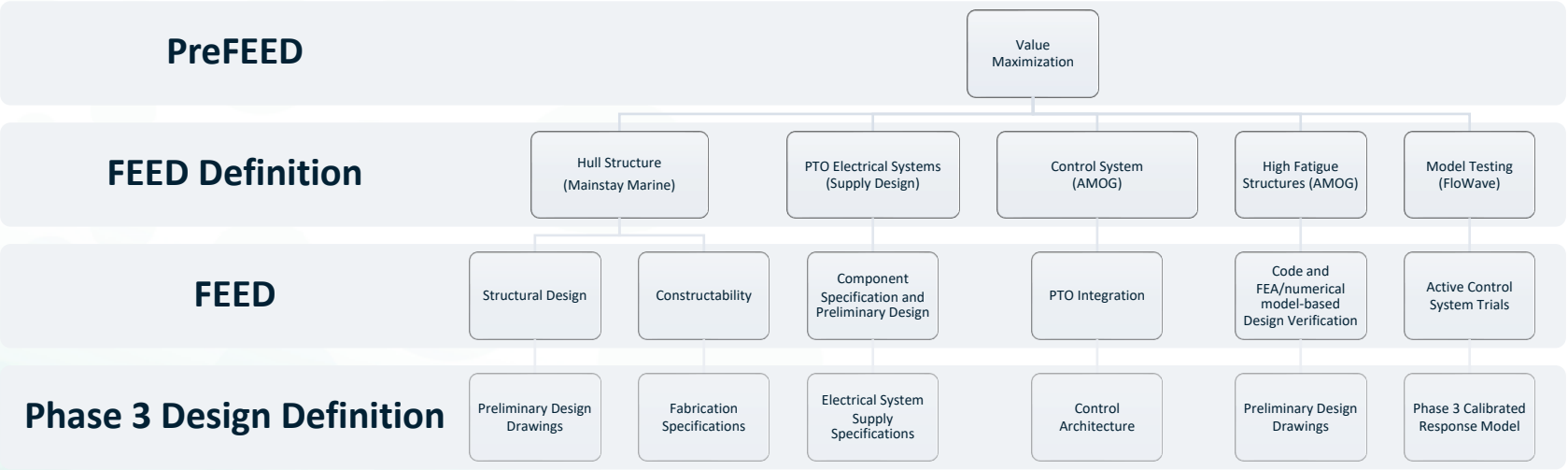
Phase 2: Activities



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Phase 2: Key Milestones

- PreFEED stage (Complete)
- Constructability and installability workshops (Complete)
- Additional model test campaign
- Design reviews
- Completion of FEED stage and Phase 2
- Phase 3 design definition

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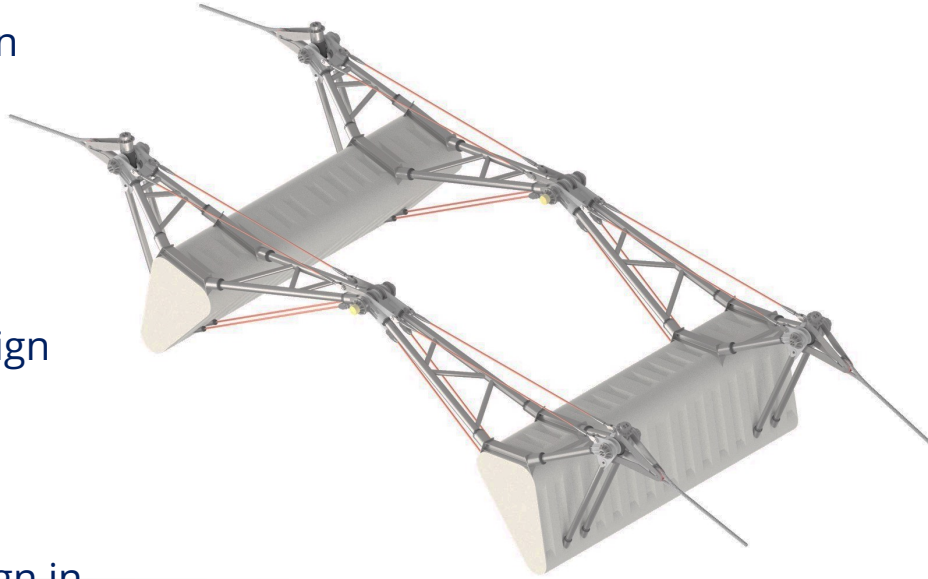
Phase 2: Progress Updates

- PreFEED scope (completed at the end of 2022):
  - Mooring, riser and structural design optimisations
  - Preliminary design reviews
- FEED scope (in progress):
  - Hull and PTO enclosure design engineering (Mainstay)
  - Electrical and thermal systems design (Supply Design)
  - Detailed numerical modelling and structural FEA (AMOG)
  - PTO design (AMOG/Supply Design)
  - Preparation for model test campaign in April (FloWave)



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